

DOCUMENT RESUME

ED 172 755

IR 007 371

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 TITLE Secondary School Alternatives in the Ivory Coast: Considerations.
 PUB DATE Jul 76
 NOTE 29p.; Paper prepared for the Evaluation Unit of the Ministry of Primary Education and Television (Abidjan, Ivory Coast, July 1976); Contains occasional light and broken type; For related documents, see IR 007 349 and IR 007 363
 EDRS PRICE MF01/PC02 Plus Postage.
 DESCRIPTORS *Conventional Instruction; Cost Effectiveness; *Developing Nations; *Educational Alternatives; Educational Development; Educational Innovation; *Educational Television; Rural Education; *Secondary Education; Technological Advancement
 IDENTIFIERS *Ivory Coast

ABSTRACT

Intended to provide information for Ivorian decision makers, this paper presents an overview of technological alternatives for the delivery of instruction at the post-primary level and their accompanying costs. Five alternatives for regular secondary education as it now exists in the Ivory Coast are reviewed: traditional, audiovisual-traditional, instructional television (ITV), ITV extension of the school (Mexican model), and distance learning. Uses of media in two approaches to terminal education and training programs are suggested, and the Telesecundaria System in Mexico is described in detail. Distance learning in adult formal/nonformal education is also discussed as a means of providing instruction for adults (18 and over) who have finished primary or drop out of secondary, and who wish to complete the first cycle of secondary, as well as for nonformal education or vocational training. Examples from other developing nations are cited, and the viability of this alternative for the Ivory Coast is discussed. A list of references is attached. (BBM)

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SECONDARY SCHOOL ALTERNATIVES IN THE IVORY COAST:
CONSIDERATION*

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July, 1976

* Paper for the Evaluation Unit
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Abidjan, Ivory Coast

SECONDARY SCHOOL ALTERNATIVES IN IVORY COAST: CONSIDERATIONS

Introduction

The Ivory Coast faces some major educational decisions in the next few years. With increasing numbers of students being accommodated in primary schools and a larger portion of them staying through CM2 to graduate, pressure is escalating for expansion of continuing educational opportunities. There are several decision options open to planners in the Ivory Coast. One is to avoid the political consequences of clear policy changes and relieve pressure by gradually allowing the present system to expand with no other changes. Another is to examine alternative models of expansion and make a decision to change the present system in one or more of its aspects. An examination of alternatives has begun (Unesco, 1973, Ivory Coast, 1975) and the present paper is not meant to supercede but to build on previous efforts.

Alternatives for post-primary schooling involve a number of dimensions which sometimes get confused in discussion. One very important aspect of secondary schooling is the pedagogical method that is used to achieve educational goals. But there are others that are also important and related to pedagogy, for example the effectiveness of the pedagogical method employed, the cost of the school system, the numbers of students it can accept and graduate, the relation of post-primary schooling to both employment and national development goals and the various technological alternatives that might best suit the first four of these aspects. This paper addresses itself primarily to the question of technological alternatives (or the ways in which instruction may utilize and be organized around various delivery systems including the teacher in a face-to-face teaching situation) and their accompanying costs. It

is clear however, that technological considerations necessarily involve the other factors such as pedagogical method and its effectiveness, numbers of students and the kinds of educational goals pursued.

Not every possible alternative for post-primary schooling can be pursued in this study and, indeed, only a limited number may be feasible within the concrete setting of the Ivory Coast. However, the present paper does not attempt to be overly limited by what is "realistic" (politically, economically or culturally). Too often in talking to different groups, one gets the impression that there is only one alternative (e.g. to use TV because a system already exists or to continue with the system as it is because too many entrenched groups are against change). The paper does not intend to develop its alternatives in a totally abstract manner that would help no one with decisions. On the other hand, it does intend to present as many genuine alternatives as possible so that decision makers can exercise real choice in developing a policy regarding post-primary and secondary schooling for their country.

I. Technology Alternatives in Education

Educational technology is generally understood to be "the practical art of using scientific knowledge about education," (Hawkrige, 1976) and often includes tasks in curriculum planning (objectives and course structure), selection of teaching strategies and media, student assessment and evaluation (McCormick 1976). What we are primarily concerned with in this paper is the selection of media or means for achieving certain educational goals. This will include at times both broadcast media such as radio and television but also other media such as film, audio and video tape cassettes, film strips as well as printed materials to help both teachers and students. In addition to

these physical inputs to the instructional task, there are the teachers themselves with a variety of training preparations organized in a variety of ways in accordance with the different technologies.

The arrangement of alternatives should provide decision makers with a variety of information that allows them to consider both the cost and the effectiveness evidence under a variety of hypotheses concerning the numbers of students reached and the kind of education provided for several technologies. Much of the evidence will be drawn from other experiences, many from developing countries.

There have been several recent reviews of the effectiveness of different educational media (Chu and Schramm, 1968, Jamison, Suppes and Wells, 1975, Schramm, 1973 and in press). The comparisons between the various alternative instructional modes from face-to-face teaching in a classroom to computer assisted instruction indicates a general conclusion of no significant difference or, put more positively, that people can learn from any medium, depending mostly on how well or poorly the medium is used in each situation. Schramm (1973) points out that for educational planners trying to decide on the choice of big (TV, film) or little (radio, programmed instruction) media the learning evidence does not suggest the better choice. He adds that other considerations (including costs, political limitation, etc) is more often the basis of choice than learning effectiveness.

One should not conclude, as a consequence of this summary, that therefore decision makers should only pay attention to costs, taking the least cost alternative. There are a variety of results in a variety of settings that make this too facile a conclusion. There are for example, other considerations

of importance, such as human reactions, political pressures, and kinds of programs to be mounted, all of which may dictate choice of more expansive alternatives. A consideration of costs, however, should help the decision makers clarify one dimension of a very complex decision.

The alternatives to be considered in this paper concern any education or training given to graduates of the primary system. The technologies appropriate to achieving different educational goals may not be totally different. Thus, a number of the alternatives suggested use television as a basic instructional medium but its use and corresponding cost may differ depending on the intensity of use and the level of teacher involvement. Printed materials are also generally assumed to some degree in each alternative though costs may vary depending on the quantities produced and the burden of instruction they are meant to carry.

The alternatives to be considered are displayed in Table One along with their media components and level of teacher involvement. A brief description of each should provide an idea of what they involve. In the next section a somewhat larger discussion of several of these alternatives along with some evidence from other projects is given.

A. Regular Secondary Schooling: This section includes five alternatives for regular secondary education as it now exists in the Ivory Coast.

1. Traditional

This alternative assumes that the present secondary education continues to function as it now exists with two exceptions: first, that cost implications be examined under different hypothetical levels of student enrollment; second, that Ivorian teachers will gradually replace foreign teachers

over the next twenty years. One assumes that educational objectives, curriculum, teaching method, organization of schools, learning outcomes and levels of efficiency (dropouts and repeaters) remain the same.

2. Audio-visual traditional

This alternative assumes no changes in educational objectives, curriculum and school organization, but, through the introduction of certain audio-visual media, that learning levels and efficiency might be changed. Such media as audio cassettes, films, film strips, simple programmed texts and perhaps video cassettes are the kinds of non-broadcast, locally controlled media that might carry a portion of instruction and introduce innovation* into secondary schooling. It is assumed that such media would not be for simple enrichment purposes.

3. ITV

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This alternative does not necessarily assume a change (reform) of secondary objectives and curriculum. It assumes that whatever learning outcomes have been obtained in use of ITV in primary could be transferred to the first cycle of secondary. It does not necessarily assume that ITV would by itself increase efficiency (lowering dropouts/repeaters), but it does suggest from other similar applications (e.g. El Salvador and Brazil) that perhaps less well trained teachers with television could produce similar learning results as better trained teachers in the traditional system. This would imply possibilities of increasing numbers of students at lower cost and perhaps more

* Innovation in education may depend on a natural growth from an experiment to wide scale adoption. Often the record shows poor results from small educational experiments. Media are often adopted on a wide scale because of economics of scale considerations, the innovation may be a catalyst for other changes in the educational system.

rapidly than for the traditional alternatives. (For a complete view of how TV can affect school systems, cf. Mayo, Hornik and McAnany (1976)).

4. ITV Extension of the School (The Mexican Model)

This alternative does not necessarily assume a change in objectives or curriculum, but it does entail a change in the organization of schools, the use of less well trained teachers, the expansion of education to hitherto unserved groups and a greater financial burden but perhaps greater involvement of local communities in secondary education. This system has potentially cost saving implications and can be envisaged as an add-on to the regular schools and not a replacement to what already exists. There is no basic reason why radio could not be substituted for television though our experience has been with television in Mexico.

5. Distance Learning

This alternative assumes that students may follow regular secondary studies on their own. It would include the use of printed materials mailed or otherwise delivered to the student, feedback on work completed, probably by correspondence, media support of the printed lessons through radio and/or television. Since it assumes that the student is self directive and learns primarily on his/her own, it may not be appropriate for younger graduates of CM2 of 12 to 15. However, for the increasing number of primary graduates among adults, it is an important alternative for finishing more schooling. There is a significant and growing literature on this approach (MacKenzie, Postgate, and Scupham, 1975).

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B. Post-primary Education and Training: This section deals with hypothetical terminal education and training programs for primary graduates.

6. Post-primary Education (Mexican Model)

This alternative conceives of a second form of terminal education to be added to the regular system. The use of the Mexican model developed in Alternative #4 above seemed most appropriate considering the circumstances of large numbers of relatively young primary graduates (11-12 years old). The same configuration of components would be used as in the fourth alternative (more extensive explanation in the following section). The system may assume either general or more technically oriented studies for the three years of post-primary. A full pledged technical education is not envisaged here.

7. Shorter Training Courses

This final alternative may best assume a helping function as opposed to a full technological alternative. Training for employment skills usually implies an older audience and some face to face demonstrations and feedback. There are examples of various media being used in technical training but rarely as a sole component. Some suggested ways in which media might serve training are both direct and indirect. Films, film strips and programmed texts have had a long history of use in training. Television and radio are often less useful because the diversity of skills and the small audiences make them less economical. However, the mass media can usefully inform a wide audience of training opportunities.

II. Specific Alternatives: Evidence from other Experiences

A. The Telesecundaria System

Essentially the TS system in Mexico attempts to use televised instruction to supplement a single trained primary school teacher

to attend one class of junior high school students (grade 7-9) covering all subject matters. (For a cost effectiveness study of the project, cf. Mayo, McAnany and Klees (1975)). The system was created in 1968 to help Mexico's Secretariat of Public Education to provide secondary education to primary graduates who had no schools in their rural areas (usually in towns of less than 5,000 inhabitants) or who had dropped or failed out of regular secondary in urban areas and wanted a second chance. There are several unique features that make the system attractive to other LDC's: the curriculum testing and crediting system is the same in traditional and TS schools (students graduating from TS have the same right as other students to enter further schooling streams); it has been found that TS students having a single primary school teacher did as well as traditional students with more highly trained secondary school teachers; each community provided a classroom and receiver while the ministry of education provided books, TV programs and the single primary school teacher per classroom. Areas of saving were in the cost of teachers (less well-trained teachers at lower salary), administration (smaller rural schools demanded less administrative overhead), better utilization of available facilities in TS towns (TV classes were held in donated or rented rooms in houses or public buildings). Benefits were that secondary education could reach students in rural areas where the government would not have built regular secondary schools because of the small number of students (class size in traditional schools was double that of TS; apparently students of TS schools, even those from poorer backgrounds and rural areas, learned about as well as in traditional schools; graduates of TS schools seem also to have been successful in continuing their schooling in institutions outside their small towns; parents seem more involved

in the education of their children when they have more responsibility for providing for classroom facilities and seeing to the operation of the school. Some drawbacks of TS in Mexico were also observed: increasing educational opportunities seems to encourage more of the able students to leave rural areas and pursue further education in the city; the television program in the TS system were of poor quality and generally did little to improve upon the traditional curriculum or promote innovative learning; the educational powerholders in the Secretariat of Public Education and the teachers unions were opposed to TS for a number of years though they were not able to prevent its creation.

How might a similar system operate in the Ivory Coast? There are a number of differences between Mexico and the Ivory Coast that would make a direct application of the models inappropriate. One must examine these factors carefully to see how well such a model for extending schooling would fit the needs and circumstances of the Ivory Coast. One clear similarity between the two countries is a dramatic increase in primary graduates and pressure to continue into the first cycle of secondary. Also there is a clear concentration of secondary schools in urban areas which means that rural primary graduates will have to migrate to continue schooling. There is a communication technology infrastructure available in both countries to produce and broadcast instructional television programs to rural and urban areas. Parents in the Ivory Coast seem to be eager for their children to have further educational opportunity and might be willing to invest in this for their children. There are some differences however. While it is expanding toward universal primary education so rapidly, the

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Ivory Coast will not have .. surplus primary teachers to take up duties in a TS system; there would be more traditions against a TS system in the Ivory Coast than those that existed (and they were formidable) in Mexico; such traditions, for example, would probably oppose giving regular credit for advancing in the system to what might seem to be not a school at all but ^{AT system is not} a casual group of TV watchers; even though a TS system could be cheaper than a traditional system, the absolute cost of expanding secondary opportunity to an increased percentage of students might be too much for the Ivory Coast budget (for example, in the Mexico project, the federal government required communities to contribute facilities; recently it has also placed the burden of paying teachers on to the state education system and now only provides programs and printed materials).

The Mexican model was spoken of above under two different alternatives, one serving the regular first cycle of secondary, the second serving a three year post-primary terminal cycle for those not continuing in secondary. The conditions spoken of above addressed the first option of providing an addition to regular secondary by adding tele-schools to the already existing traditional secondary institutions. Some of the problems of this option might not exist for the second use of this model.

For example, one would expect less opposition from the more traditional school interest groups among teachers, educational bureaucracy and some parents if a separate system was created for those not passing the exam for sixieme. The post-primary schools could exist close by (or even use primary school facilities through double scheduling) and

perhaps use some primary school teachers (again on a double shift for extra pay or some less extreme form of this). The overall costs of increasing post-primary through this model would probably be a good deal less both absolutely and per student than on equivalent expansion of the model for regular secondary.

The possible added problems that face a post-primary option do not lie in the model but rather in the content and in the employment problem. One would have to try to decide what post-primary students are being trained for and then see what evidence exists about the effectiveness of serving these purposes. As was mentioned earlier, the Mexican model has indicated that students can learn general secondary subjects (English, Spanish, history, math, science, etc.).

What there is little evidence about is the effectiveness of ITV or radio in vocational or technical subjects. General technical education costs many times general education (a UNESCO report (UNESCO, 1973) puts secondary education at eight times the cost of primary, technical at twenty times the cost). Mexico had a technical course in its Telesecundaria but it was the least popular with students and the one in the opinion of project managers that seemed the least effective. If post-primary wished to develop a curriculum (or curricula, one for urban, one for rural needs) that placed some stress on development of technical skills, then more money would have to be invested in careful development of content and some resources for tools at the classroom level and an opportunity to practice these skills.

The following table of inputs with their accompanying notes helps

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to specify the components of the TS system and their importance
in achieving their goals.

Table Two
Regular TS Inputs

- 1 primary¹ teacher per class (four years experience at upper primary teaching CM 1 & 2)
- 20 minute TV program² for each subject matter each day (2-3 hrs/day)
- printed materials
 - teacher guides³ for each subject matter
 - student work books⁴
 - student texts⁵
- meeting place⁶
- facilities⁷ (desks, table, blackboard, chalk - as basics; library, small laboratory etc. - as extras)
- parent/teacher association⁸
- 1 inspector for every 20 (?) TS establishments⁹

Notes on Inputs

1. Experienced primary school teachers might be particularly difficult to lure away from the primary system. The problem is twofold: increasing their salaries and resolving the problem of status (are they primary or secondary teachers?). Mexico finally created a special bureaucratic status for them after many years of struggle with the teachers union and dissatisfied TS teachers.
2. Several problems would face any TV programming for this model. First, would the one channel now available be able to broadcast all six years of primary plus four years of even heavier (more TV dependent) secondary programming. A second channel seems called for. Video cassettes are discussed elsewhere but do not seem feasible in this

model. The production schedule for Bouahe would obviously increase and the center grow. This may or may not be very effective depending on solution of production problems of the Center (cf. Evans and Klees, 1976).

3. These become especially important since classroom teachers are not subject matter specialists.
4. The use of well planned (even programmed instruction) student workbooks to allow exercise, and either self or teacher correction and feedback is especially important because a specialist teacher is not available in this model. These would add to the expense but financing may be provided either by students or the local sponsoring organization.
5. Texts in Mexico have gone through a number of developments. Several things are important to recall. First, Mexico has a major infrastructure in printing and publishing that made the production of books easier and probably less expensive (millions of textbooks are produced each year). Second, in attempting to adopt the secondary curriculum to a TV and an accompanying text Mexico curriculum writers found they had to rethink and reorganize the traditional material to a great extent. It was improved in their opinion, but a few years later it had to be redone because of a general educational reform. A reform at the time of choosing some secondary alternatives would allow both tasks to be done at the same time.
6. There may not be a sufficient number of rooms available in homes or public buildings as there were in Mexico. The suggestion made earlier that primary school facilities might be used in late afternoon or early evening might have a double advantage: more efficient use of existing facilities and non-interference with primary TV broadcasting. Mexico used churches, city halls, homes, libraries, etc.

7. Different communities had different kinds of classroom equipment. Many parents and/or students built their own desks, tables, bookcases, etc. Some communities raised money to build their own buildings with laboratories, a library, etc. The social aspect of financing is apparent. Parents might ask why they should pay for what others get from the government. The financing scheme for this model needs to be examined.
8. This was an important element in the success or failure of Telesecundaria schools in Mexico. A weak local sponsor meant a weak school. The advantage in this system is that the local community is more involved in the schooling of its children and can exert more control over it. On the other hand a weak local group would often mean failure.
9. Mexico set up their TS system as an experiment and have never really resolved how it was to be integrated into the regular secondary system. It has a separate administrative organization with its own inspectors. The Ivory Coast would be able to avoid this problem by integrating the system from the beginning. In any case inspectors or pedagogical advisors are even more important in TS schools where teachers are not specialists and need more help than regular secondary teachers.

B. AV Supplemented Traditional Instruction

This alternative lends itself more to the improvement of learning than to the extension of secondary to larger numbers at lower unit costs. There are no examples of large scale use of such technologies for change in a school system in third world countries as there are of television. Schramm (1973) points out that there is little evidence about learning effectiveness in these ancillary media though what there is (especially for film) seems to fall into the no significant difference category in media comparisons. Quoting the General Learning Corporation's study on media costs (1968), Schramm discards film as being too costly to compete with other media beyond a limited number of students. He finds some evidence favoring programmed texts as do Jaminson et al (1975), but little detail is cited and no examples come from developing countries. Practically no effectiveness data are cited by either author or film strips and audio cassettes, nor on video cassettes.

Given this relative dearth of evidence concerning these media and especially the lack of examples of large scale use in developing countries, one can only speculate on how they might be used as an alternative to the traditional secondary system. Several assumptions need to be made. First, the secondary system will not be essentially changed in its objectives, curriculum and school organization from the traditional. Second, this alternative would include all public secondary schools in its scope. Experimental classes have not been particularly successful in spreading educational innovations and changing learning systems. Third, this alternative is even more

dependent on being able to specify subject matter to particular media. Greater specification could made differences in effectiveness and in cost reduction. (For example, if there are a series of films on high school science that are available and adapted to local needs, these could be a major cost savings.) Fourth, wherever possible the media in this alternative would be used to reach more students for lower unit costs as well as to improve the quality of learning.*

How, then, might some combination of these smaller media meet the criteria of the above assumptions? (1) Film: because of the relative high cost of producing good instructional film, an alternative approach might be used in this case. Some time be spent in identifying what film material exists in France, the U.S., and Europe that might be adaptable to secondary curriculum needs. One thinks most readily of science series but useable material may exist in mathematics and foreign language instruction (English, for example). Duplication of film is expensive so that a system of circulating a limited number of films or their translation into video cassettes would probably be

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- * One should note the difference between this alternative and what the former BERES group was thinking about with these local media. In a working document from BERES in February, 1976 (BERES,1976), the emphasis was rather placed on innovation in teaching and more active learning were primary objectives. Media in this view were to be used by students and teachers as instruments to produce a common outcome of learning. This is one form of using media for enrichment but is not a use of technology that reduces costs or reaches more people.

cheapest. (2) Audio Cassettes: this technology is well developed and in wide spread use. It has been mostly used in language laboratories and for other subjects where the instruction is individualized. It is not impossible that audio cassettes could be used for group instruction but a good speaker system would have to be installed if classes were large enough to displace the teacher time even a little. The most obvious use of this technology is in language instruction, music and perhaps some part of social studies. It is similar to the use of radio in education (cf. review of this literature in Jamison, McAnany and Spain (eds.) Radio in Education and Development, in press) except that it is not broadcast. Most use of instructional radio at secondary level has been in a distance learning context, discussed under a separate alternative. Evidence indicates that students can learn from radio but many of the cases are where no alternative is available and those students are highly motivated. In regular school settings where teachers are available, outside of strictly individualized instruction, there may be lack of motivation to learn except from the teacher.

(3) Video cassette: the ITV infra-structure makes production of TV programs no major problem. The use of video cassettes instead of broadcasting may have certain advantages; lessen the load on the single TV channel; provide flexibility for schedules of secondary schools; reach a small number of schools/pupils more cheaply than broadcasting costs. But there are disadvantages; possible technical problems of putting programs on video cassettes; distribution problem of physical cassettes; danger of loss or damage; maintenance of cassette player at school sites. There is no obvious way that video cassettes could increase reach of instructor to more students given the classroom sizes. It would not be essentially different from primary ITV where TV is an add on cost

to teacher instruction. (4) Programmed texts: programmed instruction has had growing use in U.S. education but its application in developing contexts has been limited. Two concerns may be relevant for use in the Ivory Coast. First, the development and use of programmed texts demands trained personnel and an appropriate production setting, neither currently existing in the Ivory Coast. Second, programmed texts may help improve learning but do not lead to an extension of secondary schooling nor a reduction of teachers. The first problem might be overcome with technical assistance from outside and the introduction of wider use of this skill in Ivorian society. This might be especially interesting for training purposes and distance learning but seems an add on cost in the present alternative.

Table Three

AV Supplement Inputs

- film: 2 half hour films for science class per week
- audio cassette: 3 half hour tapes in English or other foreign language/wk;
2 half hour tapes in French
- video cassette: (experimental use of half hour tape/wk in African
history)
- programmed texts: for mathematics for use in half of the time devoted to
math/wk
- hardware: 1 16mm film projector per school (assuming not more than 25
science classes use it one hour/wk)
1 video tape player per school (assume half hour use per wk/class)
1 audio cassette per class with capacity of reaching class of
35 students (?? whether to set up a language laboratory
situation - much more costly)

C. Distance Learning*: Adult Formal/Nonformal Education

The distance learning alternative although not strictly to handle the problem of young primary graduates (11-17 years old) would be relevant to the growing number of adults (18 and over) who have finished primary or drop out of secondary and who wish to complete the first cycle of secondary. It is also a possible model to be used in the nonformal education or vocational training of adults not seeking a school degree. For this report, however, attention will be given only to the formal education use of distance learning.

There are a number of experiences with distance learning that are beginning to be evaluated (cf. MacKenzie, Postgate and Scupham). They generally have involved adults at all levels of the school system, but Australia has had over forty years experience for radio-correspondence schools for scattered primary students. There are a growing number of countries that have begun to use distance learning approaches for secondary level students. Brazil, Colombia, Korea, Mexico and Japan

*This approach is sometimes called open learning also. Distance learning stresses the fact that students learn away from school, on their own, usually individually in their homes and require instruction by mail or media, and send homework in by mail. Open learning puts stress on the liberal enrollment policy and the democratization of educational opportunity. Many students enrolling in this system work full time and study at night. The system using media to reach students at home presumably makes the opportunity even greater to receive more education.

have all used some form of media (TV and/or radio) in their systems. Usually along with some kind of correspondence. Japan has had the longest experience with distance learning for secondary students and the results have been encouraging.

There are two sets of questions to be asked in the present paper; first, what are the components of a secondary level distance learning system and what are the implications of each for the effectiveness of the project; second, how well would such an approach fit the circumstances of the Ivory Coast?

Components: The distance learning approach usually includes the following components.

1. Carefully constructed printed texts (either on each course separately or a combined text book)
2. worksheets or homework assignments (to be completed and mailed or taken to a (local) corrector who reviews and marks the student's work and returns it within a relatively brief time (2-3 weeks))
3. radio and/or TV programs to reinforce or teach certain aspects of the curriculum
4. Attendance at brief face-to-face sessions with teachers (sometimes one day a month at local tutorial center or one week of summer school sessions or both).

There are variations on this structure depending on local needs and constraints, but this is the general pattern. Sometimes, for instance, there are science kits sent to students to be used and returned or available at local tutorial centers. Students take courses for credit, take exams and, if successful, receive recognized secondary degrees.

What has the increasing experience in this area to say about costs and effectiveness. First, the demand for education in a given society must outstrip opportunity so that people who have not completed a certain level of education are motivated enough to study, often in addition to full time work. Second, the distance learning system must be geared to not just enroll a large number of students, but to provide the necessary support to allow a significant number to graduate. Dropout rates are expected to be much higher in such a system than in an ordinary secondary but there is a point at which a distance learning system would not only be inefficient but can become a political tool to give people the illusion of having more opportunity than they do. Third, the organization of the system is more important than in regular face-to-face schooling situations. Printed material needs to be more carefully developed and pretested because no teacher is available to answer student questions. Slow feedback does not allow a student to review and strengthen weak points (both reliable mail or other delivery, and well organized and dedicated correctors are essential). Fourth, a different approach to cost-effectiveness needs to be taken in distance learning. As MacKenzie et al (1975) point out students in this kind of a system are quite different from regular school attendees. They may, for example, be forced by work or family constraints to drop out of studies for a time and it is difficult to put values on courses completed as opposed to degrees earned. Making comparisons with regular school alternatives may be impossible since many students in distance learning programs simply could not study in other circumstances because of holding full time jobs or being isolated from learning institutions.

Viability in the Ivory Coast: There are several circumstances that make this an attractive alternative for the Ivory Coast: (a) it is a country

with rising number of primary graduates and a society where educational screening puts a high premium on more formal education. One could assume that there would be a demand for alternative forms of formal education (Japan began a secondary distance learning program in 1953 because demand for entry far outstripped places and still does so); (b) Ivory Coast, with its experience with ITV, has the beginnings of an infrastructure to create both printed and broadcast materials; (c) the demand for secondary will outstrip supply for many years to come and the country will want to offer as much educational opportunity as it can afford. A distance learning system could democratize opportunity at a cheaper cost per student.

There are, however, a number of circumstances that would mitigate against the adoption of such an alternative: (a) there is a general prejudice of institutional educators against such a "second class" system (although the success of the British Open University has lessened this a little). The Ivory Coast with strong roots in French classical education would probably be even more hostile to such an innovation. (The solution may be to appeal to planners and politicians to whom such an approach often makes much more sense.). (b) Delivery and feedback systems that depend on mail might be placing too great a strain on the postal service. Alternative systems may be costly and/or unreliable. (This is not insurmountable since Nigeria and Kenya have operating distance learning systems). (c) Organizational/management personnel may be in short enough supply to place the system beyond present Ivorian capacity. More foreign technical assistance might be necessary and Ivorization of education delayed.

Table Four
Distance Learning Inputs

- printed texts¹ (one for each student)
- workbooks/homework sheets (one set for each student)
- radio programs² (half hour per subject per week)
- mail or other delivery (stamps or "free" delivery - average of one delivery per student every two weeks)³
- correctors⁴ (?? per student per course)
- tutors⁵
- administration

Notes to Table Four:

1. These would probably be a reduced basic minimum text not providing everything a complete set of text books in regular secondary usually gives. Mexico is experimenting a very much reduced but perhaps better organized text for a junior high school level distance learning (in addition to the Telesecundaria).
2. Radio was chosen for this alternative both for cost reasons and because more programming space may be available. Moreover, more students are likely to have access to a radio at home.
3. Alternate systems of delivery might be through local schools and school inspectors.
4. Correctors are often teachers hired part time (to earn extra money) and so do not form a large body of full time workers.
5. These again may be part-time teachers from other schools hired to take a monthly review or a week long summer school seminar.

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